

EVALUATION OF SOUTHERN PINE BEETLE INFESTATION ON THE
CHATTAHOOCHEE NATIONAL FOREST, GEORGIA

By

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INTRODUCTION

Aerial sketchmap and ground surveys were conducted on all seven Ranger Districts of the Chattahoochee National Forest during the fall and early winter of 1975 (Figure 1). Data used to evaluate the southern pine beetle infestations on the Tallulah, Chattooga and Brasstown Ranger Districts were collected during a pilot test of a multi stage sampling system in September and October. The pilot test is part of the USDA Expanded Southern Pine Beetle Research and Applications Program. The aerial and ground surveys of the Armuchee, Chestatee, Cohutta and Toccoa Districts were performed during December 1975. The total survey covered approximately 1,653 M acres within the purchase boundary of the Forest. Survey data indicated that approximately 1,206 spot infestations affecting some 36,128 trees were present on the Forest.

The current outbreak on the Forest is part of a South-wide outbreak involving all 13 states of the Southeastern Area. Infestations on the Tallulah, Chattooga, Brasstown, Chestatee, and Toccoa Districts began in the summer of 1971. Infestations on the Cohutta and Armuchee were first detected during the summer of 1975. Southern pine beetle activity on the Tallulah, Chattooga, Brasstown and Toccoa Districts is moderately heavy. On the Chestatee, Cohutta, and Armuchee the activity is light and seems to be in the beginning states of an outbreak.

METHODS

Standard aerial sketchmap procedures were used for this evaluation.^{1/} Data from 25 and 50% aerial sketchmap surveys were expanded to represent 100 percent coverage and corrected for observer error.

A portion of the spots detected during the aerial phases of the evaluation were examined on the ground to confirm the cause of tree mortality, the percent of spots that were active and to assess the general condition of the beetle population.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Iandroctonus frontalis* Zimm.

Host - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine. Susceptible southern yellow pines on the Chattahoochee National Forest are Virginia (*Pinus Virginiana* Mill) shortleaf (*P. echinata* Mill), loblolly (*P. taeda* L.) and pitch (*P. rigida* Mill).

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, *Ceratocystis* spp., which slow down or block conduction of water in the stem. The size of an infestation may range from a single tree to several thousand trees.

Life Cycle of the Beetle - Southern pine beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate and change to adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as four or five generations may be produced annually in the area.

^{1/} Detection of Forest Pests in the Southeast, 1970. USDA, USFS, SA, S&PF, Div. of FPM, Pub. S&PF 7, Atlanta, GA. 51 pp.

RESULTS AND DISCUSSION

Table 1 summarizes the results of this evaluation.

Results of the evaluation showed a moderately high level of infestation on the Tallulah, Chattooga, Brasstown and Toccoa Ranger Districts: 8.7 infested trees/M acres host type on the Tallulah, 35 infested trees/M acres host type on the Chattooga, 11 infested trees/M acres host type on the Brasstown and 693 infested trees/M acres host type on the Toccoa District. On the Cohutta, Chestatee and Armuchee a low level of infestation is currently present: 9.8 infested trees/M acres host type was observed on the Cohutta District. However, most of the infested trees were located on private lands near Ellijay, Georgia. On the Chestatee 1.8 infested trees/M acres host type were observed and on the Armuchee 1.7 infested trees/M acres of host type.

RECOMMENDATIONS

Current southern pine beetle suppression efforts should be continued on the Tallulah, Chattooga, Brasstown and Toccoa Ranger Districts. On the Chestatee, Cohutta and Armuchee where infestations are scattered and low in numbers on Forest Service lands some control efforts through salvage might significantly reduce the likelihood of an outbreak situation.

Any control action taken should follow those procedures outlined in FSM-5250.

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

Trees having nearly developed broods (usually the red and fading trees).

Trees having young broods (usually the green, recently infested trees).

Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.
3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent Lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel).

Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

4. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated within two or three weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

Table 1. Summary of southern pine beetle evaluations, Chattahoochee National Forest, Georgia, 1975.

	Ownership Unit		
	Chattooga RD	Tallulah RD	Brasstown RD
1. Results compiled from data collected during the aerial phase of the evaluation:			
Survey type	Sketch Photo	Sketch Photo	Sketch 9/9/75
Date of aerial survey	9/9/75	9/9/75	9/9/75
Total acreage surveyed	214,859	248,383	269,383
Total susceptible host type	121,583	108,831	31,320
Total number of spots within the survey boundary	487	194	306
Spots per M acre of host type	37	9.8	137
Average spot size (trees)	35	16	23
Range of spot sizes (trees)	1-530	1-200	1-150
2. Results compiled from data collected during the ground and aerial phases of the evaluation:			
Date of ground phase	11/20/75	11/7/75	10/30/75
Infested trees per M acre of host type	30.04	8.74	11.07
Total number of infested trees within the survey boundary	4,261	952	3,467
Ratio of green infested to total red and fading trees	1:19.08	1:9.30	1:5.24
Total volume of infested trees	74,437 cu. ft.	20,468 cu. ft.	50,618 cu. ft.

Table 1 Continued

					Ownership Unit			
					Armuchee	Chestatee	Cohutta	Toccoa
1. Results compiled from data collected during the aerial phase of the evaluation:								
Survey type	Sketch	Sketch	Sketch	Sketch				
Date of aerial survey	12/12/75	12/3/75	12/3/75	12/2/75				
Total acreage surveyed	242,305	136,285	250,742	291,040				
Total susceptible host type	240,356	38,307	42,733	3,805				
Total number of spots within the survey boundary.	62	26	31	100				
Spots per M acre of host type26	.7	24	20.4				
Average spot size (trees)	10.5	3.5	33	34				
Range of spot sizes (trees)	1-500	1-100	1-500	1-1000				
2. Results compiled from data collected during the ground and aerial phases of the evaluation:								
Date of ground phase	12/12/75	12/8/75	12/11/75	12/9/75				
Infested trees per M acre of host type.	1.7	1.8	9.8	693				
Total number of infested trees within the survey boundary.	408	70	420	3,396				
Ratio of green infested to total red and fading trees	1:6	1:3.3	1:19	1:4.1				
Total volume of infested trees.	4,814	756	5,964	45,167				
	cu. ft.	cu. ft.	cu. ft.	cu. ft.				

FIGURE 1 Area covered by aerial and ground evaluation surveys for southern pine beetle infestation on the Chattahoochee National Forest, 1975

